TABLE 8-continued

β-mode in dimension j

Step	control	Sa	Sb	Sc	Sd	# cycles	Overlap Memory (R/W/x, level)	Inter-Pass Memory (R/W/x)	Input (R/x)	Dataflow paths	Function	Performed actions
3		0	1	0	1	$N_L \cdot 2^L$	x	W	R	C + B2		Load data from input, perform the filtering and write results in the IPM
4		x	0	1	0	2M	R(i), W(i − 1)	x	x	A1 + A2	Prepare the creation of next level	Load data from the overlap memory of the current level into the filter FIFO for preparing the creation of the next level. Copy the last filter FIFO register into the overlap memory of the previous level for preparing the overlap with the adjacent block in the same level (at a much later stage).
5		1	1	0	1	$N_L \cdot 2^{L-1}$	x	R/W	x	B1 + B2	The creation of next level is actually started.	Load data from the IPM, perform the filtering and write results at the same place in the IPM
6	i++; if (i > L) break; else goto step 4;											

TABLE 9

α-mode (α2) within the image (full loading of 2M + 1 input values before starting the filtering) in dimension j

Step	control	Sa	Sb	Sc	Sd	# cycles	Overlap Memory (R/W/x, level)	Inter-Pass Memory (R/W/x)	Input (R/x)	Data-flow paths	Function	Performed actions
1	i = 1										Prepare the creation of level 1	
2		0	1	0	0	2M	x	x	R	C		Load data from the input into the filter FIFO, without performing any calculations
3		0	1	0	1	* α_L^2 − (2M + 1)	x	W	R	C + B2		Load data from input, perform the filtering and write results in the IPM
4		1	1	1	0	2M	W(i − 1)	R	x	A1 + B2	Prepare the creation of next level	Load data from the IPM of the current level into the filter FIFO for preparing the creation of the next level. Copy the last filter FIFO register into the overlap memory of the previous level for preparing the overlap with the adjacent block in the same level (at a much later stage).
5		1	1	0	1	$\frac{\alpha_L^2 - \alpha_i^2}{2^i - 2M}$	x	R/W	x	B1 + B2	The creation of next level is actually started.	Load data from the IPM, perform the filtering and write results at the same place in the IPM
6	i++; if (i > L) break; else goto step 4;											

*Note: α_i^2 represents the number of values which have to be read in the input level in order to create the first value in level i in the α2 mode

TABLE 10

α-mode (α1) at the image borders (symmetrical extension, zero-padding, . . .) in dimension j

Step	control	Sa	Sb	Sc	Sd	# cycles	Overlap Memory (R/W/x, level)	Inter-Pass Memory (R/W/x)	Input (R/x)	Data-flow paths	Function	Performed actions
1	i = 1										Prepare the creation of level 1	
2a		0	1	0	0	M + 1	x	x	R	C		Load data from the input into the filter FIFO, without performing any calculations